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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/880,207	06/13/2001	Wilhelmus Hendrikus Alfonsus Bruls	PHNL 000345	5320
24737	7590	03/23/2004		
PHILIPS INTELLECTUAL PROPERTY & STANDARDS P.O. BOX 3001 BRIARCLIFF MANOR, NY 10510			EXAMINER ROSARIO-VASQUEZ, DENNIS	
			ART UNIT 2621	PAPER NUMBER 7
DATE MAILED: 03/23/2004				

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/880,207

Applicant(s)

BRULS ET AL.

Examiner

Dennis Rosario-Vasquez

Art Unit

2621

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 13 June 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☐ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 13 June 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 6.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Priority***

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

### ***Specification***

2. The disclosure is objected to because of the following informalities:

Page 1, line 24: "from the at" should be replaced with "from at".

Page 1, line 26: "of the at" should be replaced with "of at".

Page 2, line 1: "static filter the at least" does not make the respective sentence clearly understood. A suggestion is to replace "static filter the at least" with "static filtering at least".

Page 5, line 16: "used in shows a" should be replaced with "used to show a".

Page 9, line 22: "consequently no too much affected" should be replaced with "consequently not much affected".

Appropriate correction is required.

### ***Claim Objections***

3. The following quotations of 37 CFR § 1.75(a) is the basis of objection:

(a) The specification must conclude with a claim particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention or discovery.

4. Claim 2 is objected to under 37 CFR § 1.75(a) as failing to particularly point out and distinctly claim the subject matter which the applicant regards as his invention or discovery.

Claim 2, line 5 states "static filter the at least", which does not make the respective claim clearly understood. Therefore the phrase of claim 2 will be interpreted as "static filtering at least" for the office action.

Appropriate correction is required.

### ***Drawings***

Figures 1,3,4 and 6 are objected under 37 CFR 1.84 (o) for not having "suitable descriptive legends" which are "required by the examiner where necessary for understanding of the drawing."

### ***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1-3, 5,7-13 and 15 are rejected under 35 U.S.C. 102(b) as being anticipated by De Jonge et al. (US Patent 5,467,380 A).

Regarding claim 1, De Jonge et al. discloses a method of noise filtering an image sequence (VI) (De Jonge et al. states, "Noise reduction for use in an x-ray examination apparatus is provided for performing weighted temporally averaging in dependence on an amount of motion in parts of successive x-ray images. Further noise reduction is performed by combining temporal averaging with spatial filtering and motion detection (abstract, lines 1-6).", characterized in that the method comprises:

a) determining (11) statistics (De Jonge et al. states," Motion detection means are provided comprising subtractors (fig. 1, numerals 14-17) for computing differences of pixel-values pertaining to pairs of successive images (fig. 1, num. 10-13 are successive images and col. 4, lines 42-44)." in at least one image of the image sequence ("five successive images" at col. 4, line 39)(VI);

and

b) calculating (14) at least one filtered pixel value ( $P_t'$ ) (Weighted pixel values are computed from the differences using a look up table at col. 4, lines 47-53 which are input to a spatial or static filter 42 of figure 1) from a set of original pixel values ( $P_t, M_i$ ) (figure 1, num. 10-13) obtained from the at least one image (Fig. 1, labeled "I subscript 1"), wherein the original pixel values ( $P_t, M_i$ ) are weighted (13) (fig. 1, num. 18-21:"LUT") under control (12,a) of the statistics (11).

Claim 2 has been addressed in claim 1 except for furnishing the weighted set of pixel values ( $P_t, N_i$ )(Using figure 1, the output of the multiplier numerals 23-26 are weighted pixel values at col. 4, lines 64-66.) to a static filter (De Jonge et al. states,"...spatial filtering...is performed in dependence on the weight factors being determined by the motion detection means (col. 5, lines 17-20)."), in which static filter the at least one filtered pixel value ( $P_t'$ ) (Output of num. 41 of figure 1) is calculated from the weighted set of pixel values ( $P_t, N_i$ ).

Regarding claim 3, De Jonge et al. discloses a method as claimed in claim 1, wherein the statistics (11) include a spatial and/ or temporal spread (S) of the set of original pixel values ( $P_t, M_t$ ) (De Jonge uses a temporal spread or a difference between pixels that are later used for filtering.).

Regarding claim 5, De Jonge et al. discloses a method as claimed in claim 1, wherein the set of original pixel values ( $P_t, M_t$ ) (11 thru 15 of figure 1) include a central pixel value ( $P_c$ ) and spatially and/or temporally surrounding pixel values ( $M_c$ ) (De Jonge et al. uses a window of 32 X 32 pixels for each successive image for thresholding at figure 1, num. 50. Difference values among pixels are computed from the windows of successive images at col. 6, lines 47-50.), wherein as a result of the noise filtering, the central pixel value ( $P_t$ ) is replaced (The pixels within the window are weighted. As a result of weighting each pixel value of the window, which includes a central pixel, is changed based on the differences of pixels values within the successive images using the LUT.).

Regarding claim 7, De Jonge et al. discloses a method as claimed in claim 1, wherein the statistics (11) are furnished to a look-up table (12), from which look-up table (12) (fig. 1, numerals 18-21: "LUT") a control signal (a) is obtained (The look up table produces weight factors), which control signal (a) controls the weighting (13).

Regarding claim 8, De Jonge et al. discloses a method as claimed in claim 2, wherein the at least one filtered pixel value ( $P_f$ ) is obtained by calculating (14) a median of the weighted set of pixel values ( $P_f, N_f$ ) (De Jonge et al. states, " Spatial filtering can be carried out in the form of...weighted median filtering or median hybrid filtering (col. 3,

lines 12-14).")

Regarding claim 9, De Jonge et al. discloses a method as claimed in claim 2, wherein the at least one filtered pixel value ( $P_t'$ ) is obtained by calculating(14) an average of the weighted set of pixel values ( $P_t, N_i$ )("weighted temporal averaging a temporal sequence of images" at De Jonge et al., col. 1, lines 51,52. Additionally, a combination of temporal averaging components (fig. 1, num. 27) and spatial components (fig. 1, num. 41) are combined at multiplier 43 at col. 4, line 61 to col. 5, line 50.

Regarding claim 10, De Jonge et al. discloses a method as claimed in claim 9, the method comprising:

a) determining (41) a spatial spread ( $S_{\text{spat}}$ ) (fig. 1, num. 14-17) calculated from spatially displaced original pixel values ( $P_t, M_i$ ) in the set of original pixel values ( $P_t, M_i, P_{t1}, P_{t2}$ ) (fig. 1, labels: I1 to I5) (De Jonge et al. states, "spatial filtering...is performed in dependence on the weight factors being determined by the motion detection means (col. 5, lines 17-20).") Note that "Motion detection means are provided comprising subtractors [Spread according to the specification includes a difference.] for computing [a displacement or] differences of pixel-values pertaining to pairs of successive images (col. 4, lines 42-44).");

b) determining (42) a temporal spread (Stemp) calculated from temporally displaced original pixel values (Pt,Pt1,Pt2) in the set of original pixel values (Pt,Mi,Pt1,Pt2) (De Jonge et al. states, "First a temporal averaging is performed involving weight factors depending on the presence of motion in the image...") Note that "Motion detection means are provided comprising subtractors for computing differences of pixel-values pertaining to pairs of successive images (col. 4, lines 42-44).") Therefore motion detection means are used for both the spatial and temporal spread.; and

c) weighting (46) the spatially displaced original pixel values (Pt,Mi) under control (43) of the spatial spread (Sspat) and the temporally displaced original pixel values 25 (Pt,Pt1,Pt2) under control (44,45) of the temporal spread (Stemp) (Addressed in claim 10).

Regarding claim 11, De Jonge et al. discloses a method as claimed in claim 10, wherein the weighted temporally displaced original pixel values (WP1,WP2) are divided (a) to lessen their weight in the filtering (47) (De Jonge et al. states," The respective look-up tables produce weight factors denoted as k.sub.1, k.sub.2, k.sub.4 and k.sub.5, having values that decrease as the differences computed by subtractors means 14, 15, 16 and 17 respectively have increasing magnitudes (col. 4, lines 50-53).")

Claim 12 is similar to and addressed in claim 5.

Regarding claim 13, De Jonge et al. discloses a method as claimed in claim 12, wherein filtered temporally displaced pixel values are used rather than temporally displaced original pixel values. During temporal averaging, differences between pixels are compared to a threshold. If the differences exceed a threshold, then the pixels values that exceeded the threshold are weighted at col. 4, lines 53-66.



Regarding claim 15, De Jonge et al. discloses a device for noise filtering an image sequence, the device comprising:

computing means (Fig. 1, numerals 14-17 computes a difference.) (11) for determining statistics in at least one image of the image sequence (VI) (This element of claim 15 was addressed in claim 1); and

filtering means (Fig. 1, num. 42 produces a spatially filtered component at col. 5, lines 29-31.) (14) for calculating at least one filtered pixel value (Pf) from a set of original pixel values (P<sub>t</sub>, M<sub>t</sub>) obtained from the at least one image, wherein the original pixel values (P<sub>t</sub>, M<sub>t</sub>) are weighted (13) under control (12,a) of the statistics (11) (This element of claim 15 was addressed in claim 1) .

***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 4,6,14 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over De Jonge et al. (US Patent 5,467,380 A) and in view of Keesen et al. (US Patent 5,055,927 A).

Regarding claim 4, De Jonge et al. teaches a spread using differences to obtain a weighted average of pixel-values for a time-sequence of successive images at col. 4, lines 53-63.

Keesen et al, in the field of endeavor of video signal transmission, teaches a temporal spread that is a sum of absolute differences (Fig. 8 of Keesen et al. is a spatio-temporal filter with a sum of absolute differences in a pixel window at col. 5, lines 60,61 and figure 8, num. 41: "SUM OF DIFFERENCES IN N x N PIXEL WINDOW".), a given absolute difference being obtained by subtracting a pixel value (fig. 8, label "TV") from a given original pixel value (fig. 8, label "HD").

It would have been obvious at the time the invention was made to one of ordinary skill in the art to modify the teachings of De Jonge et al. of obtaining an average pixel value using differences with the teachings of Keesen's spatio-temporal filter of figure 8, because Keesen's spatio-temporal filter switches to a better signal based on detecting erroneous interpolation at col. 6, lines 39-45. Additionally, Keesen et al. states that the spatio-temporal filter can be improved via weighting factors during transmission with decoding at col. 6, lines 52-55.

Regarding claim 6, Keesen et al. teaches a method as claimed in claim 2, wherein the set of weighted pixel values ( $P_t, N_i$ ) (Keesen et al., fig. 8, num 43: "WEIGHTING" uses pixels from fig. 8, num. 41) is obtained by taking for each pixel in the set of original pixels ( $P_t, M_i$ ) (Fig. 8, label "HD" and "TV"), a combination of a portion  $\alpha$  of the original pixel value ( $P_t, M_i$ ) and a portion  $1-\alpha$  of a central pixel value ( $P_t$ ) (The window of numeral 41 is a N X N window which contains a central and neighboring pixels in the N x N window).

Regarding claim 14, the combination De Jonge et al. and Keesen discloses a method of encoding (1) (Keesen, figure 1, num. 2:"TV ENCODER") an image sequence (VI), wherein the image sequence (VI) is noise filtered according to a method as claimed in claim 1.

Claim 16 is similar to and addressed in claim 14.

### ***Conclusion***

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Sharma et al. (US Patent 6,192,079 B1) is pertinent as teaching a method of obtaining absolute differences between frames (fig. 7).

Zhang et al. (US Patent 6,037,986 A) is pertinent as also teaching a method of obtaining absolute differences between frames (fig. 4 and col. 6, line 48 is an equation).

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dennis Rosario-Vasquez whose telephone number is 703-305-5431. The examiner can normally be reached on 9-5.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Leo Boudreau can be reached on 703-305-4706. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2621

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DRV

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